

SPABOND™ 540LV




MODIFIED EPOXY ADHESIVE

- ▮ Long working times for bonding large polyester, vinylester and epoxy parts
- ▮ Exceptional impact toughness & peel strength for structural bonding
- ▮ Low exotherm & shrinkage in thick bondlines
- ▮ Sag resistance of up to 20mm on a vertical surface

INTRODUCTION

Spabond™ 540LV is a modified ambient curing epoxy adhesive designed for structural bonding of polyester, vinylester or epoxy laminates.

Spabond™ 540LV provides the benefit of extended working time compared to similar polyester and vinylester based adhesives. The high toughness and excellent gap filling properties make this adhesive ideal for bulkheads, structural frames / stringers and hull-to-deck joints on medium to large production boats.

SYSTEM PROPERTIES AT 20°C	GAP FILLING*	HARDENER	WORKING TIME*	20°C CLAMP TIME*	CURED COLOUR	PAGE
Spabond™ 540 LV Ideal for bonding polyester, vinylester and epoxy laminates	Up to 20 mm	Standard	2 hours	Min. 18 hours		3
		Slow	4 hours	Min. 36 hours		4
		Extra Slow	7 hours	Min. 48 hours		5

**working properties are highly subjective to ambient conditions and should only be used as an approximate guideline.*

PRODUCT INFORMATION

The product is available in a number of formats please contact your local customer support or download the latest product catalogue available on www.gurit.com.

TRANSPORT & STORAGE

The resin and hardeners should be kept in securely closed containers during transport and storage. Any accidental spillage should be soaked up with sand, sawdust, cotton waste or any other absorbent material. The area should then be washed clean (see appropriate Safety Data Sheet). Adequate long term storage conditions will result in a shelf life of 2 years for both the resin and hardeners. Storage should be in a warm dry place out of direct sunlight and protected from frost. The storage temperature should be kept constant between 10°C and 25°C, cyclic fluctuations in temperature can cause crystallization. Containers should be firmly closed. Hardeners, in particular, will suffer serious degradation if left exposed to air.

COMPONENT	UNITS	10 – 25°C
Spabond™ 540LV Resin	months	24
Spabond™ 540 Hardeners	months	24

For more information on crystallization please refer to the Adhesives section on the Gurit website. (www.gurit.com)

INSTRUCTIONS FOR USE

The product is optimised for use at 15 - 25°C and below a relative humidity of 70%. At lower temperatures the components thicken and may eventually become unworkable. To ensure accurate mixing and good workability pre-warm the resin & hardener as well as the surfaces to be bonded before use.

SURFACE PREPARATION

Before using the product ensure that surfaces to be bonded are clean, dry & dust-free. Prepare all surfaces by abrading with medium grit paper or other suitable abrasive, remove dust then wipe with acetone.

Polyester / vinylester / Epoxy - prepare using one of the following methods:

- ▮ Peel-ply surface – To achieve the optimum bond strength it is recommended to use a nylon peel ply. This will provide a clean, contaminant-free textured surface, suitable for secondary bonding.
- ▮ Abrading - Before using the product ensure that surfaces to be bonded are clean, dry and dust-free. Prepare all surfaces by abrading with 80-120 grit paper or other suitable abrasive, remove dust then wipe with acetone.

MIXING & HANDLING

For mixing volume in the 5-10Kg range it is advised that a drill mixer with a hexical head is used. The drill speed should be minimal to ensure the mix does not cavity and encapsulate air. Once fully mixed the adhesive should have a uniform colour

If mixing by hand, mix thoroughly for a minimum of one minute, paying particular attention to the sides and bottom of the mixing vessel, to ensure no streaks remain. Once fully mixed the adhesive should have a uniform colour. Use from pot quickly to maximise resin working life.

APPLICATION

To achieve the best bond, adhesive should be applied to both surfaces of the joint to ensure good wetting of the joint surfaces. The joint should be clamped as soon as possible after application of the adhesive. Please refer to the working properties section to determine the maximum open time for the adhesive.

HEALTH AND SAFETY

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. Gurit recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturising cream should be used after washing.
2. Overalls or other protective clothing should be worn when mixing, laminating or sanding. Contaminated work clothes should be thoroughly cleaned before re-use.
3. Eye protection should be worn if there is a risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
4. Ensure adequate ventilation in work areas. Respiratory protection should be worn if there is insufficient ventilation. Solvent vapours should not be inhaled as they can cause dizziness, headaches, loss of consciousness and can have long term health effects.
5. If the skin becomes contaminated, then the area must be immediately cleansed. The use of resin-removing cleansers is recommended. To finish, wash with soap and warm water. The use of solvents on the skin to remove resins etc must be avoided.
Washing should be part of routine practice:
 - ▮ before eating or drinking
 - ▮ before smoking
 - ▮ before using the lavatory
 - ▮ after finishing work
6. The inhalation of sanding dust should be avoided and if it settles on the skin then it should be washed off. After more extensive sanding operations a shower/bath and hair wash is advised.

APPLICABLE RISK & SAFETY PHRASES

Gurit produces a separate full Safety Data Sheet for all hazardous products. Please ensure that you have the correct SDS to hand for the materials you are using before commencing work.

SPABOND™ 540LV & STANDARD HARDENER

All data has been generated from typical production material and does not constitute a product specification.

MIXING AND HANDLING

PROPERTY	UNITS	SP 540LV RESIN	STANDARD HARDENER	MIXED SYSTEM	TEST METHOD
Appearance - colour	Description	Yellow	Purple	Grey	-
Appearance - form	Description	Thixotropic paste			-
Mix ratio by weight	Parts by weight	100	93	-	-
Mix ratio by volume	Parts by volume	100	100	-	-
Density at 21 °C	g/cm ³	1.14	1.05	1.10	Archimedes

COMPONENT & MIXED SYSTEM VISCOSITY

PROPERTY	UNITS	15 °C	20 °C	30 °C	TEST METHOD
Working time (20mm thickness) *	hrs:min	2:30	02:00	1:00	-
Clamp Time* (time to Shore A>90)	hrs	24	18	10	BS 5350 Part C1
Sag resistance*	mm	25	20	15	-

ADHESIVE PERFORMANCE

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C	TEST STANDARD
Cleavage on steel	F _{cleavage}	kN	5.1	5.4	BS 5350 Part C1
Lap shear on steel	τ _{steel}	MPa	15	18	BS 5350 Part C5
Lap shear on polyester FRP*** (cured for 24hrs after infusing)	τ _{polyester}	MPa	>9 (exceeded interlaminar properties)	>10 (exceeded interlaminar properties)	BS 5350 Part C5
Lap shear on epoxy FRP***	τ _{epoxy}	MPa	14	14	BS 5350 Part C5

CURED MECHANICAL AND THERMAL PROPERTIES

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C****	TEST STANDARD
Glass Transition Temperature	T _{g2}	°C	52	58	ISO 6721 (DSC)
Tensile Strength	σ _T	MPa	17	19	ISO 527-2
Tensile Modulus	E _T	GPa	0.70	0.85	ISO 527-2
Tensile Strain	ε _T	%	50	40	ISO 527-2
Charpy (notched)	-	kJ/m ²	8	6	ISO 179-1
Shore D Hardness	-	-	69	70	-

*working time properties are highly subjective to ambient conditions and should be used as an approximate guideline for Spabond™ 540LV

***peel plied finish, all samples failed within the laminate.

****initial cure of 24 hours at 21°C

SPABOND™ 540LV & SLOW HARDENER

All data has been generated from typical production material and does not constitute a product specification.

MIXING AND HANDLING

PROPERTY	UNITS	SP 540LV RESIN	SLOW HARDENER	MIXED SYSTEM	TEST METHOD
Appearance - colour	Description	Yellow	Green	Light Green	-
Appearance - form	Description	Thixotropic paste			-
Mix ratio by weight	Parts by weight	100	93	-	-
Mix ratio by volume	Parts by volume	100	100	-	-
Density at 21 °C	g/cm ³	1.14	1.06	1.10	Archimedes

COMPONENT & MIXED SYSTEM VISCOSITY

PROPERTY	UNITS	15 °C	20 °C	30 °C	TEST METHOD
Working time (20mm thickness) *	hrs:min	4:30	04:00	2:00	-
Clamp Time* (time to Shore A >90)	hrs	48	36	20	BS 5350 Part C1
Sag resistance*	mm	25	20	15	-

ADHESIVE PERFORMANCE

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C	TEST STANDARD
Cleavage on steel	F _{cleavage}	kN	5.1	6.2	BS 5350 Part C1
Lap shear on steel	τ _{steel}	MPa	14	16	BS 5350 Part C5
Lap shear on polyester FRP*** (cured for 24hrs after infusing)	τ _{polyester}	MPa	>9 (exceeded interlaminar properties)	>9 (exceeded interlaminar properties)	BS 5350 Part C5
Lap shear on epoxy FRP***	τ _{epoxy}	MPa	14	14	BS 5350 Part C5

CURED MECHANICAL AND THERMAL PROPERTIES

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C****	TEST STANDARD
Glass Transition Temperature	T _{g2}	°C	49	52	ISO 6721 (DSC)
Tensile Strength	σ _T	MPa	14	18	ISO 527-2
Tensile Modulus	E _T	GPa	0.69	0.85	ISO 527-2
Tensile Strain	ε _T	%	70	40	ISO 527-2
Charpy (notched)	-	kJ/m ²	7	7	ISO 179-1
Shore D Hardness	-	-	66	69	-

*working time properties are highly subjective to ambient conditions and should be used as an approximate guideline for Spabond™ 540LV

***peel plied finish, all samples failed within the laminate

****initial cure of 24 hours at 21°C

SPABOND™ 540LV & EXTRA SLOW HARDENER

All data has been generated from typical production material and does not constitute a product specification.

MIXING AND HANDLING

PROPERTY	UNITS	SP 540LV RESIN	SLOW HARDENER	MIXED SYSTEM	TEST METHOD
Appearance - colour	Description	Yellow	Blue	Green	-
Appearance - form	Description	Thixotropic paste			-
Mix ratio by weight	Parts by weight	100	91	-	-
Mix ratio by volume	Parts by volume	100	100	-	-
Density at 21 °C	g/cm ³	1.14	1.04	1.09	Archimedes

COMPONENT & MIXED SYSTEM VISCOSITY

PROPERTY	UNITS	15 °C	20 °C	30 °C	TEST METHOD
Working time (20mm thickness) *	hrs:min	10:00	7:00	3:00	-
Clamp Time* (time to Shore A >90)	hrs	72	48	28	BS 5350 Part C1
Sag resistance*	mm	20	20	15	-

ADHESIVE PERFORMANCE

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C	TEST STANDARD
Cleavage on steel	F _{cleavage}	kN	5.45	7.1	BS 5350 Part C1
Lap shear on steel	τ _{steel}	MPa	6.6	13.7	BS 5350 Part C5
Lap shear on polyester FRP**** (cured for 24hrs after infusing)	τ _{polyester}	MPa	10 (exceeded interlaminar properties)	13 (exceeded interlaminar properties)	BS 5350 Part C5

CURED MECHANICAL AND THERMAL PROPERTIES

MECHANICAL PROPERTIES	SYMBOL	UNITS	7 DAYS AT 21°C	16 HOURS AT 50°C****	TEST STANDARD
Glass Transition Temperature	T _{g2}	°C	36	58	ISO 6721 (DSC)
Tensile Strength	σ _T	MPa	10	17	ISO 527-2
Tensile Modulus	E _T	GPa	0.18	0.76	ISO 527-2
Tensile Strain	ε _T	%	85	37	ISO 527-2
Charpy (notched)	-	kJ/m ²	N/A	6	ISO 179-1
Shore D Hardness	-	-	56	69	-

*working time properties are highly subjective to ambient conditions and should be used as an approximate guideline for Spabond™ 540LV

***peel plied finish, all samples failed within the laminate

****initial cure of 24 hours at 21°C

NOTICE

All advice, instruction or recommendation is given in good faith but the selling Gurit entity (the Company) only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the Company. All advice is given subject to the terms and conditions of sale (the Conditions) which are available on request from the Company or may be viewed at Gurit's Website: www.gurit.com/terms-and-conditions.aspx

The Company strongly recommends that Customers make test panels in the final process conditions and conduct appropriate testing of any goods or materials supplied by the Company prior to final use to ensure that they are suitable for the Customer's planned application. Such testing should include testing under conditions as close as possible to those to which the final component may be subjected. The Company specifically excludes any warranty of fitness for purpose of the goods other than as set out in writing by the Company. Due to the varied nature of end-use applications, the Company does, in particular, not warrant that the test panels in the final process conditions and/or the final component pass any fire standards.

The Company reserves the right to change specifications and prices without notice and Customers should satisfy themselves that information relied on by the Customer is that which is currently published by the Company on its website. Any queries may be addressed to the Technical Services Department.

Gurit is continuously reviewing and updating literature. Please ensure that you have the current version by contacting your sales contact and quoting the revision number in the bottom left-hand corner of this page.

CONTACT INFORMATION

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24-HOUR CHEMICAL EMERGENCY NUMBER

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